LÄMPÖÄSSÄ
Ground Source Heat Pumps Since 1983

USER MANUAL
LÄMPÖÄSSÄ T 40 - 80 / P 40 - 80

LÄMPÖÄSSÄ 3/2010

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1. GENERAL INFORMATION

We thank you for your confidence in our products and congratulate you on making an excellent choice! You have selected a long-lasting and environmentally friendly Lämpöässä geothermal heat system. We hope that you will enjoy Lämpöässä's heating system which will give you peace of mind for decades. It is important to read the user and maintenance instructions carefully. Please retain this manual for future use and reference should problems occur.

1.1. Safety precautions

To ensure the Lämpöässä geothermal heat system operates in a trouble-free manner and in order to obtain the best operating efficiency, the system must be transported and installed in accordance with the instructions provided by the manufacturer. After installation is complete, the check list provided must be reviewed in order to minimise any installation errors. The manufacturer shall not be responsible for any breakages of equipment which is not installed correctly or any costs incurred as a result of this.

The pipe and electrical installations for the Lämpöässä geothermal heating system can only be installed by qualified persons. If problems occur during installation, we recommend that you contact your retailer or our maintenance department. The telephone number for the maintenance department can be found in the documents delivered with the Lämpöässä heat pump. Electrical connections for the installation of the Lämpöässä may only be set up by qualified electricians.

In Lämpöässä T models – to prevent a compressor breakdown – the compressor and water in the storage tank must be preheated for 6 hours before the heat pump is started for the first time. Press the motor protective switch down and switch on the power. This stops the compressor starting and enables the electrical immersion to heat up the compressor and water in the storage tank. The compressor can be started after 6 hours of preheating.

The warranty of the Lämpöässä T compressor is not valid if preheating is not carried out.

1.2. Transportation

The Lämpöässä heat pump must always be transported in a vertical position. If tilting the system is unavoidable, for example to pass through a doorway, it may only be tilted to the left side or back as seen from the front of the heat pump. The unit may be moved from beneath using a forklift, for example. Do not go underneath the equipment while it is being lifted! A transportation platform is fastened on both sides of the heat pump using screws. When the screws on the platform are removed, the adjustable feet used for final installation can be found inside.

1.3. Installation area

We recommend that the Lämpöässä geothermal heat pump be installed in a warm space which has a floor drain. During installation and when filling of the ground loop, some geothermal fluid mixture may be splashed on the floor. Glycol/water mixture can be used as well. The chosen area does not have to be fireproof.

The floor must be able to withstand the weight of the heat pump and a full water tank. The floor must also be sufficiently even, because the heat pump must be as level as possible. Final adjustments can be made using the adjustable feet underneath the equipment.

1.4. Removing the packaging

Remove the plastic wrapping and corner padding from around the product. Check that the heat pump has not suffered any damage during transportation. If the heat pump is found to be damaged, the company which delivered the product must be immediately notified.

Also check the contents of the delivery immediately.

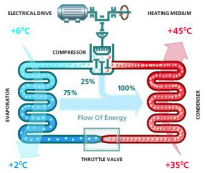
1.5. Structure and operating principles

1.5.1. Structure

The Lämpöässä geothermal heat system consists of a network of heat collection pipes, a geothermal fluid mixture circulating within the network and a geothermal heat pump unit. The geothermal heat pump unit consists of a compressor, evaporator, condenser and a refrigerant circulating inside the pump. The heat collection fluid in the ground loop and the refrigerant do not mix at any stage of the process.

1.5.2. Operation

The Lämpöässä heat pump transfers heat from the ground, water system or a bore well. Of the total thermal energy required for heating, Lämpöässä collects more than 70% from natural sources. Less than 30% of the electrical energy is required for the collection of thermal energy. This energy is used to run the various components in the system.



The heat collection pipe is a plastic pipe (PEM 40/10) with a water and ethyl alcohol or glycol-water mixture circulating inside. It is placed 1-1.2 metres deep in the ground or at least 3 metres deep in water. The bore well is normally 100-200 metres deep with a diameter of 140-165 mm. The heat pump is used in the transfer of heat from the water and ethyl alcohol mixture. Approximately three degrees of heat is transferred into the refrigerant circulating inside the heat pump, after which the geothermal fluid returns to the ground loop to heat up again.

Heat is transferred from one fluid to another in the evaporator, in which the refrigerant evaporates thanks to the low suction head of the compressor. This binds the heat from the geothermal fluid with the help of a disk thermal exchanger. The pressure of the gaseous refrigerant is increased using a compressor which makes the temperature of the refrigerant rise. The heat contained in the gas is transported in the condenser to heat the water in the water tank and thus produce hot water for use. As the heat is transferred, the gas turns into fluid once again and is carried back through a dehumidification filter and an expansion valve to circulate.

The Lämpöässä geothermal heat pump is suitable for producing hot water and heating single-family households, terraced houses, offices, hotels and industrial halls. Heat distribution can be implemented using floor heating with circulating water, water-filled radiators or the circulation of hot air. Floor heating has the best operating efficiency.

In order to ensure trouble-free operation, all Lämpöässä heat pumps have been test-run, set up and tested by the manufacturer.

2. INSTALLATION

2.1. Before installation

Pipe assemblies for the installation of the Lämpöässä system may only be installed by qualified persons. The unit must be installed in accordance with the instructions provided and a check list must be reviewed after installation in order to minimise errors. The manufacturer shall not be responsible for any breakages of equipment which is not installed correctly or any costs incurred as a result of this.

Check that

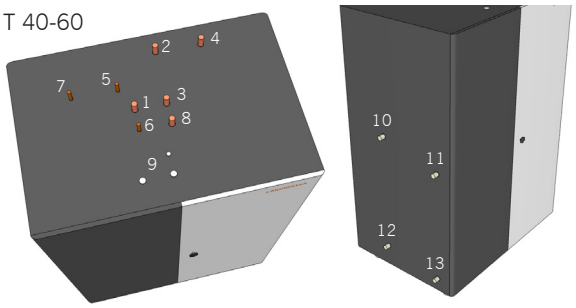
- all the required hoses and sensors are included in the delivery
- the heat pump has been correctly fitted
- the assemblies on top of the heat pump are intact
- the fuse size is correct for the main fuse and the heat pump (see technical specifications)
- collector pipes and the feed pipes have been installed correctly

2.2. Pipe-laying

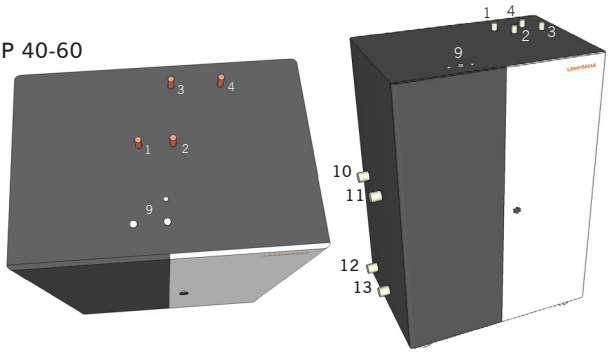
Assemblies of the heat pump

LÄMPÖÄSSÄ T	40-60	80
1. To the boiler 1	Cu35 mm	1½"
2. From the boiler 1	Cu35 mm	1½"
3. To the boiler 2	Cu35 mm	1½"
4. From the boiler 2	Cu35 mm	1½"
5. To the superheater 1	Cu15 mm	Cu18 mm
6. From the superheater 1	Cu15 mm	Cu18 mm
7. To the superheater 2	Cu15 mm	Cu18 mm
8. From the superheater 2	Cu15 mm	Cu18 mm
9. Lead-through sensors/electric		
10. Collector pipe 1, flow	1¼"	2½"
11. Collector pipe 1, return	1¼"	2½"
12. Collector pipe 2, flow	1¼"	2½"
13. Collector pipe 2, return	1¼"	2½"

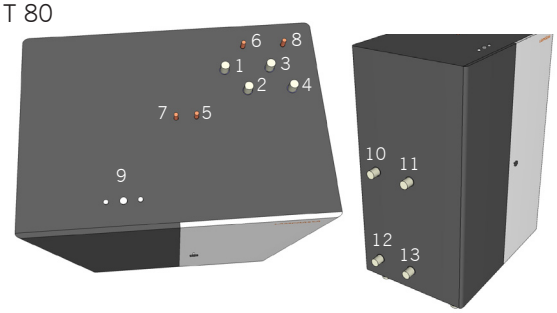
T 40-60



P 40-60



T 80



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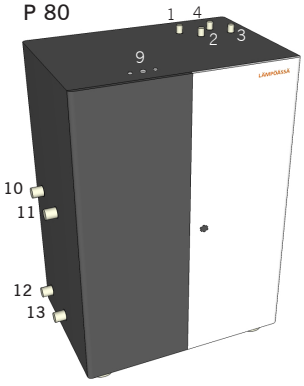


2.3. Filling and de-aeration of the ground loop

Equipment required for the filling and deaeration of the ground loop:

- container, 60 litres
- a submersible pump fitted with a filter, lifting height approximately 30 m
- water and ethyl alcohol, or glycol-water mixture (1:1) with a frost resistance of -17 degrees Celsius
- 2 x textile hose 1-2”
- couplings adaptable to filling unit

THE FILLING AND DE-AERATION PROCESS

Please check that the ground loop has been correctly connected (see “Connecting the ground loop” section) and that the compressor has been preheated (see ”Safety precautions” section).

1. Install filling and de-aeration assemblies to the collector pipe (return).
2. Attach textile hoses to filling unit.
    - Attach a textile hose from submercible pump to the filling unit (between brine pump and shut-off valve).
    - Attach the textile hose from filling unit (between shut-off valve and collector pipe) to mixing tank.
3. Fill the container with a geothermal fluid mixture (ethyl alcohol water or glycol with a frost resistance of -17 degrees Celsius).
4. Open filling unit valves and close the shutt-off valve.
5. Turn on the submercible pump.
6. Start brine pump by turning the S1 (or S2) switch to upper position.
7. Add water and ethyl alcohol mixture to the mixing tank until no more fluid can enter the pipes.
8. Keep the submercible pump running until the fluid is clear and no gurgling can be heard from the pipes. Please note! Deaeration usually takes several hours and helps ensure that all the air is removed from the system and that there are no malfunctions once the system is started. LEAVE NO PRESSURE IN THE NETWORK!
9. Turn pumps off.
10. Close filling unit valves.
11. Remove textile hoses.
12. If both compressors have own collector pipe, fill another collector pipe by repeating phases 1-13.
13. Clean the ball valve with integral filter of both collector loops.

Filling and deaeration have now been completed. Install the expansion tank, if the collector pipe is planned to be pressurized. PLEASE NOTE! Once the heat collecting pipes have been placed in a bore well, we would advise users to switch the positions of the textile hoses in the group of fill valves during filling and deaeration. This increases the efficiency of the pipes.

2.4. Boiler connection

Connect the boiler to the ground source heat pump accordingly the HWAC drawings (chapter 6). The connection may vary depend on the boiler type.

2.5. Heating connection

The heating circuit 1 is the main circuit with higher temperature e.g. heating with radiators. The heating circuit 2 is the secondary circuit with lower temperature e.g underfloor heating.

Pipes in the heating network are connected to the ground source heat pump using either textile hoses (network of radiators) or using a fixed piping network (floor heating network). These connections stop sound from passing into the pipes. All heating connections (for example, a heating radiator for an air conditioner or a heated towel rail) must be made to the heat piping. When the network piping on the is in place, filling may commence. The pipes in the network are filled with water. **Please note! If renovating, ensure that the heat distribution piping has been properly rinsed before connecting the heat pump.**

Filling a heating system fitted with a pressure gauge:

- open the fill valve on the heating network
- fill the piping with water
- deaerate the piping through the water tank
- fill and deaerate the network until all the air has been removed and leave the pressure at 1–1.2 bar
- maximum values
    - heating network 1,5 bar
    - DHW network 9 bar

2.6. Domestic water connection and circulation of water

Complete the piping connections according to the piping connections diagram in section 2.2. The circulation water pump is installed on the input side of the heat pump. The mixing valve is fitted to the hot water pipe in order to prevent burns.

The overflow pipe is joined to the floor drain as instructed or to an overflow funnel if the distance to the floor drain is more than two metres. The overflow funnel must be directed down towards the floor drain. The backpressure valve is fitted to the cold water joint on the input side.

2.7. HEPAC check list

Check that

- the connections are tight and there are no leaking valves
- the expansion tank on the heating system and fill side is properly installed
- the overflow pipe on the shut-off valve and the pressure gauge on the heating system have been properly installed
- the heating system has been filled and deaerated appropriately
- collector pipes has been installed, filled and deaerated appropriately

2.8. Electrical installation

Only qualified electricians are permitted to carry out electrical work on the heat pump according to general regulations.

Device		T 40 / P 40	T 60 / P 40	T 80 / P40
Electrical connection		400V 3N~	400V 3N~	400V 3N~
Fuse size	A	3 x 35	3 x 50	3 x 63

The Lämpöässä heat pump is connected to a 400 V (50 Hz). The Lämpöässä heat pump has been fitted with an integrated electrical switchboard to which is permanently powered. A plastic-coated wire is used as a supply line. This wire travels to the master switch in a casing pipe.

2.8.1. Main switch

The main switch must install before other installations.

2.8.2. Sensors

The master switch must be installed before any other installation takes place. In order for the outdoor sensor to recognise weather conditions as effectively as possible, it is very important that it be placed in the correct location. The outdoor sensor should be placed on the north-western or northern side of the building to avoid the effects of the morning sun. If the sensor cannot be placed as recommended, ensure that it is protected from direct sun light.

The sensor is placed approximately 2/3 of the way up the wall of the building near the corner. A sensor should not be placed under a roof, in a place protected from the wind or over a vent, doors or windows where the temperature is not the normal outdoor temperature.

In order for the room sensor to detect average indoor temperatures as reliably as possible, it must be placed in a central and open location, for example a hallway between several rooms or the staircase. String a bipolar electrical line (at least 0.5 mm^2) from the heat pump to the room sensor. Position the room sensor approximately 2/3 of the way up the wall. Connect the room sensor lead to the heat pump. Please note! Leads must be correctly connected in order for the heat pump to operate.

In order to obtain the best results, the room sensor and leads can be tested in diffirent locations before being permanently installed.

T10-31	Ouman 201	Connection strip	Cable type
	Mixing valve	51, 52, 53	3 X 1,5 mm2
	Ouman 203	Connection strip	Cable type
	Heating Circuit 1 Mixing valve motor	51, 52, 53	3 X 1,5 mm2
	Heating Circuit 2 Mixing valve motor	55, 56, 57	3 X 1,5 mm2
	DHW Mixing valve motor	59, 60, 61	3 X 1,5 mm2

	Ouman 201	Connection strip	Cable type
T40-80	Outdoor sensor	1	2 X 0,75 mm2
	Room sensor (equipment)	3	2 X 0,75 mm2
	Flow sensor	2	2 X 0,75 mm2
	Hot gas sensor	11	2 X 0,75 mm2
	Sensor, lower part	10	2 X 0,75 mm2
	Sensor, upper part	9	2 X 0,75 mm2
	Ouman 203	**Connection strip**	**Cable type**
T40-80	Outdoor sensor	1	2 X 0,75 mm2
	Flow sensor HC1	2	2 X 0,75 mm2
	Room sensor HC1 (equipment)	3	2 X 0,75 mm2
	Flow sensor HC2	5	2 X 0,75 mm2
	Flow sensor DHW	7	2 X 0,75 mm2
	Sensor, upper part	9	2 X 0,75 mm2
	Sensor, lower part	10	2 X 0,75 mm2
	Hot gas sensor	11	2 X 0,75 mm2

Room sensor TMR (equipment): connection from sensor to room space.

2.9. Electricity check list

Check that

- all phases going to the switchboard are in the correct phase sequence
- tension difference between phases is 400V
- the main fuse size is correct
- the fuse size of ground source heat pump is correct (slow)
- as needed, the current control is installed in to the electric control panel

2.10. Operating switch

Q1	Main switch	
F10	Control current	
S1	Manual Control Brine Pump 1	
	Position II	Brine pump
	Position O	-
	Position I	Conpressor and pumps
S2	Manual control Brine Pump 2	
	Position II	Brine pump
	Position O	-
	Position I	Conpressor and pumps
S4	Magnetic Valve	Manual Control of Magnetic Valve
T1	Start Delay, Compressor 2	Start delay adjusting
F1	Compressor 1	Compressor motor protection
F2	Brine pump 1	Brine pump motor protection
F3	Condenser pump 1	Condenser pump motor protection
F4	Compressor 2	Compressor motor protection
F5	Brine pump 2	Brine pump motor protection
F6	Condenser pump 2	Condenser pump motor protection

2.11. Startup

Before startup, check that:

- the heating system has been connected, filled and deaerated appropriately
- the ground loop has been installed, filled and deaerated appropriately
- electrical connections have been made appropriately and the outdoor sensor (room sensor, optional accessory) has been installed
- fuses are in position: *on*

Starting:

- Turn on the main switch.
- Press down black motor protection switches F1-F6.
- Turn switches S1-S2 to upper position.
- Turn switch F6 (Control Current) to upper position.
- Check the rotation direction of brine pumps. Check the phase rule in case of the incorrect rotation direction.
- Turn switches S1-S2 to lower position.

The Lämpöässä ground source heat pump starts. If the installation is carried out carefully and in accordance with the instructions provided the system will work faultlessly from the very beginning.

Possible problems during startup

Problem	Cause	Solution
Fuses always blow when the compressor is being started.	You are using the wrong type of fuse.	Check that the fuse is automatic: C or D/ceramic fuse: SLOW or with a snail icon.
	Temporary connections at the site are causing an overload on the fuses.	Reduce load.
The ground loop pump does not start.	The regulator may not be getting any power.	Check the regulator fuse.
	The regulator is not authorised to start the pump.	Check the measured/set values.
The ground loop pump does not circulate fluid.	The brine pump is rotating in the wrong direction.	Switch the location of the two phases.
	Shut-off valves are in the fill position.	Check that the deaeration and fill valves are in the 'closed' position and that the intermediate valve is open.
The compressor runs for a little while and the steam pressure switch goes off.	There may still be air in the ground loop.	Deaerate the ground loop.
	There may be a leak in the refrigerant loop.	Contact the manufacturer.
The fluid level in the ground loop fill container drops suddenly after startup.	There is a leak in the system (the smell of ethyl alcohol is strong), there is a leak in the ground loop or there is still air in the ground loop.	Check the condition of valves in the deaeration group on the air lock and the shaft seal on the ground loop pump and, if possible, the ground loop extension joints, or deaerate.
Thermal relays go off when starting.	The compressor or the ground loop pump is short-circuited or one of the phases is not activated.	Check electrical connections.
	Fuses in the master switchboard of the building are faulty.	Check and replace fuses as required.

3. USER INFORMATION

3.1. Lämpöässä settings

Information in this section has been compiled from the Lämpöässä 203/GT Manual, which, in addition to the following, includes more detailed information on the various functions and detailed reading(s).

3.2. Care and maintenance

The Lämpöässä heat pump is an easy-care heating system. It requires no regular maintenance and its simple structure makes Lämpöässä reliable to use. If the installation is carried out carefully and in accordance with the instructions provided, there is usually no need for maintenance. The fill container inside the geothermal heat pump should be checked every couple of weeks during the first few months and afterwards approximately once a month for the first year of use thereafter.

3.3. Troubleshooting

If an alarm sounds, we always recommend that you first check that the regulator does not have the 5-minute compressor running prevention enabled. The facility can be overridden by turning the master switch to 0 and back.

The geothermal heat pump is controlled according to two measured values: the measured value at the bottom and at the top of the water tank. A minimum value is determined for each set value in the “Set values” section.

In practice, consumption of hot water also starts the compressor. The lower the minimum set value for the lower part of the water tank, the more economical the use of the system. However, it is important to note when determining the set value that values which are too low will reduce the amount of hot water available.

Problem	Possible cause	Solution
The compressor does not start	The water tank temperature is adequate and in accordance with the regulator.	No action required.
	The compressor has been stopped for less than 5 minutes.	No action required.
	Fuse problem.	Check the condition of the fuses in the master switchboard.
The compressor does not start and the regulator display reads: “divergence alarm reading 4 compressor operation”.	The protection switch for the motor has gone off. OR The suction pressure switch on the pressure switch has gone off.	Press the protection switch for the motor. OR Set off the switch.
No text is visible on the regulator.	The device is not getting any power.	Check that the control current and master switch are on.
	A fuse has blown.	Replace the fuse.
	The display is broken/the circuit board of the regulator is faulty.	Contact maintenance.
Thermal relays go off immediately when power is switched on.	The protection switch for the motor goes off if the equipment is short-circuited or one of the phases is not on.	Contact an electrician.
	Fuses in the master switchboard of the building are faulty.	Check the condition of the fuses and replace as required.

Regulator display reads: Enter code	You have attempted to change the settings in maintenance mode.	Special settings for maintenance mode are not required for normal use. Set values for temperatures can be set in normal mode.
The system does not produce enough heat	A sudden drop in outdoor temperature may temporarily cause inadequate heating power in new buildings, because moisture contained in the structure takes up a lot of heat when it dries.	No action required.
	During the first year, the ground loop may not produce heat at full power because the earth around the ground loop pipes has not yet become more solid.	No action required.
The set value and measured value for the regulator do not match.	A maximum limit has been used for the set values.	
	A spiking over-voltage caused by a lightning strike has caused a fault in the condenser, causing the temperature to drop from the actual values.	The regulator must be replaced (not under warranty).
	The regulator motor has been set on manual and the regulation does not take place.	
	In the summer, the temperature in the room where the heat pump is located may rise to up to 30 degrees Celsius. In these cases, the temperature sensor for the output water is reading the air temperature instead of the temperature for the output water.	No action required.
The compressor is on all the time or for long periods of time.	A lot of heat is needed, for example the outdoor temperature is very low or the structure is drying during the first year's use of the building.	No action required.
	Lack of refrigerant. Can be detected from bubbles in the liquid container even after some minutes of use.	Contact a refrigeration supplier or maintenance.
	The processor/software on the regulator is faulty.	Turn off the control current switch for 10 seconds and turn it back on. If turning off the power does not help, contact maintenance.

If the above instructions do not help, please contact your local Lämpöässä dealer.

PLEASE NOTE! The warranty shall be subject to the existence of an appropriately completed and issued warranty certificate and a certificate signed by the user stating that the mechanic instructed the user on how to operate the equipment.

4. TECHNICAL SPECIFICATIONS

4.1. Chart

Lämpöässä		T 40 / P 40	T 60 / P 60	T 80 / P 80
Dimensions width depth height	 mm mm mm	 1300 900 1800	 1300 900 1800	 1300 900 1800
Weight	kg	543	619	735
Electrical connection		400V 3N~	400V 3N~	400V 3N~
Supplied output 35/50°C *	kW	41,2/37,8	62,4/57,8	89,3/75,4
Supplied input 35/50°C *	kW	2x4,8/5,9	2x7,9/10,2	2x9,6/12,4
Start current	A	135	159	218
Fuse size (slow)	A	3x35	3x50	3x63
Supply cable size *	mm^2	5x10 s	5x16 s	5x25 s
Compressor		Scroll	Scroll	Scroll
Refrigerant	g	8 000	10 000	16 000
Max length of ground loop / compressor	m	4x500	2x600	4x500
Water tank capacity	litres	2 000**	2 000**	2 000-3 000**
Max pressure radiator	bar	1.5	1.5	1.5

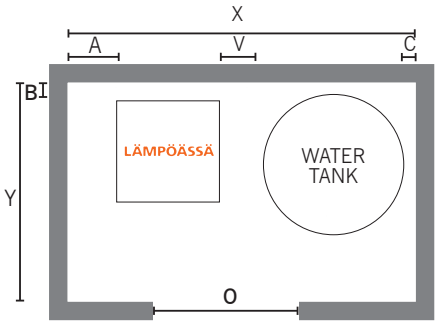
* Ground collector 0°C ** Recommendation superheat tank

4.2. Space requirements

The heat pump requires 50mm more floor space to the side of assemblies than its external dimensions. All Lämpöässä T40-T80 geothermal heat pumps are 1.8 metres in height. Approximately 0.4 metres of space must be reserved for the assemblies on top of the heat pump. This should be taken into account when placing the heat pump in a low room, such as a basement.

The Lämpöässä geothermal heat pump should be installed in a warm, insulated space which has a floor drain, because some ground loop fluid may be splashed on the floor when the ground loop is filled. The chosen area does not need to be fireproof.

mm	T40/P40	T60/T60	T80/P80
A	600	600	600
B	50	50	50
C	50	50	50
O	1500	1500	1500
X	3500	3500	3500
Y	2000	2000	2000
V	400	400	400



5. WARRANTY

Suomen Lämpöpumpputekniikka Oy offers a two- (2) year warranty with the Lämpöässä T geothermal heat pumps it manufactures. The manufacturer shall not be responsible for any breakages of equipment which is not installed correctly, any brekages of equipment which is installed contrary to the instructions provided, or any costs incurred as a result of these actions.

The warranty shall be subject to the existence of an appropriately completed and issued warranty certificate and a certificate signed by the user stating that the mechanic instructed the user on how to operate the equipment.

NOTICE! The warranty of the Lämpöässä T compressor is not valid if preheating is not carried out.

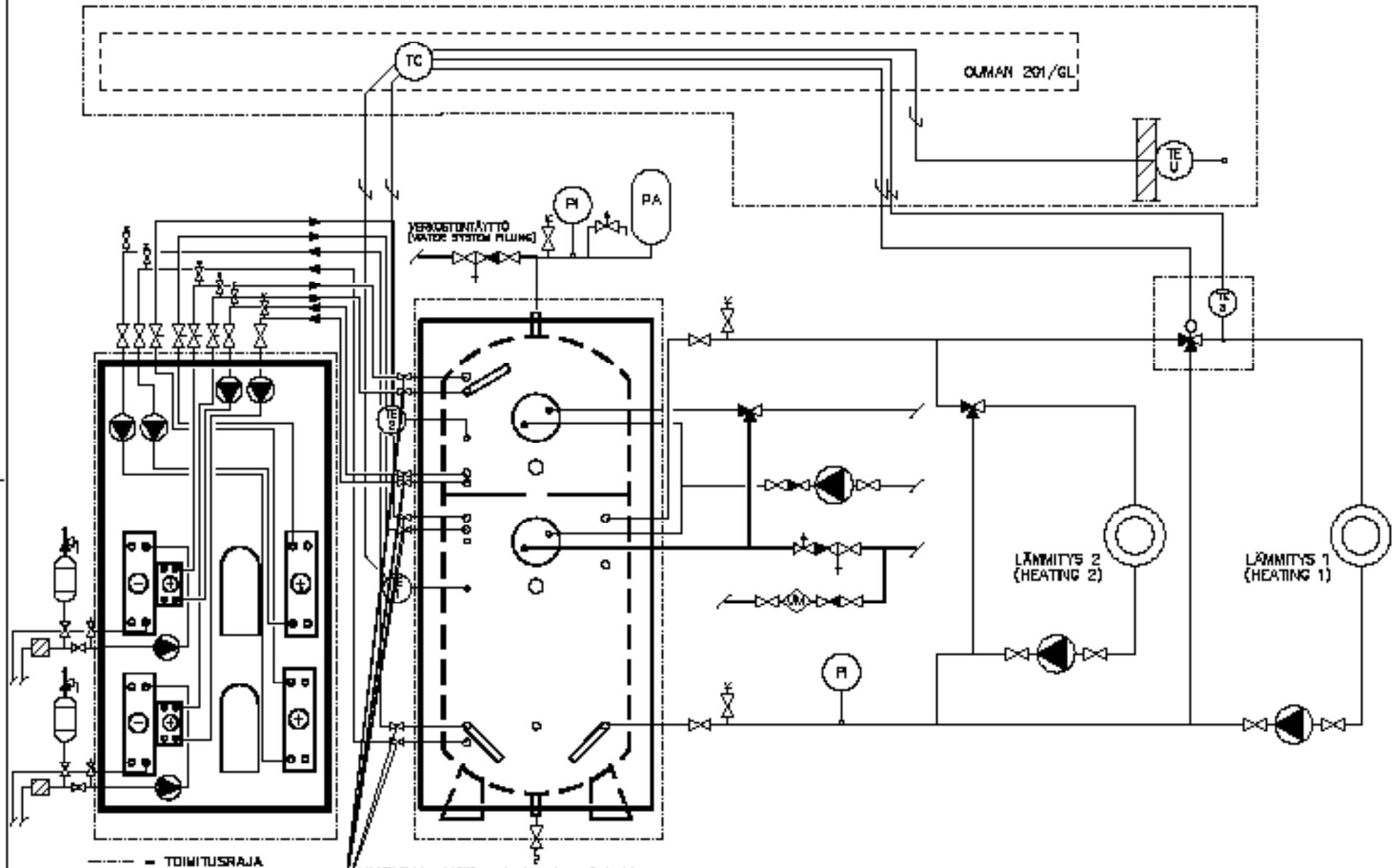
6. APPENDIX

Connection diagram, device T 40-80, 1 circuit

Connection diagram, device T 40-80, 2 circuit

Electrical diagram, device T 40-60

Electrical diagram, device T 80

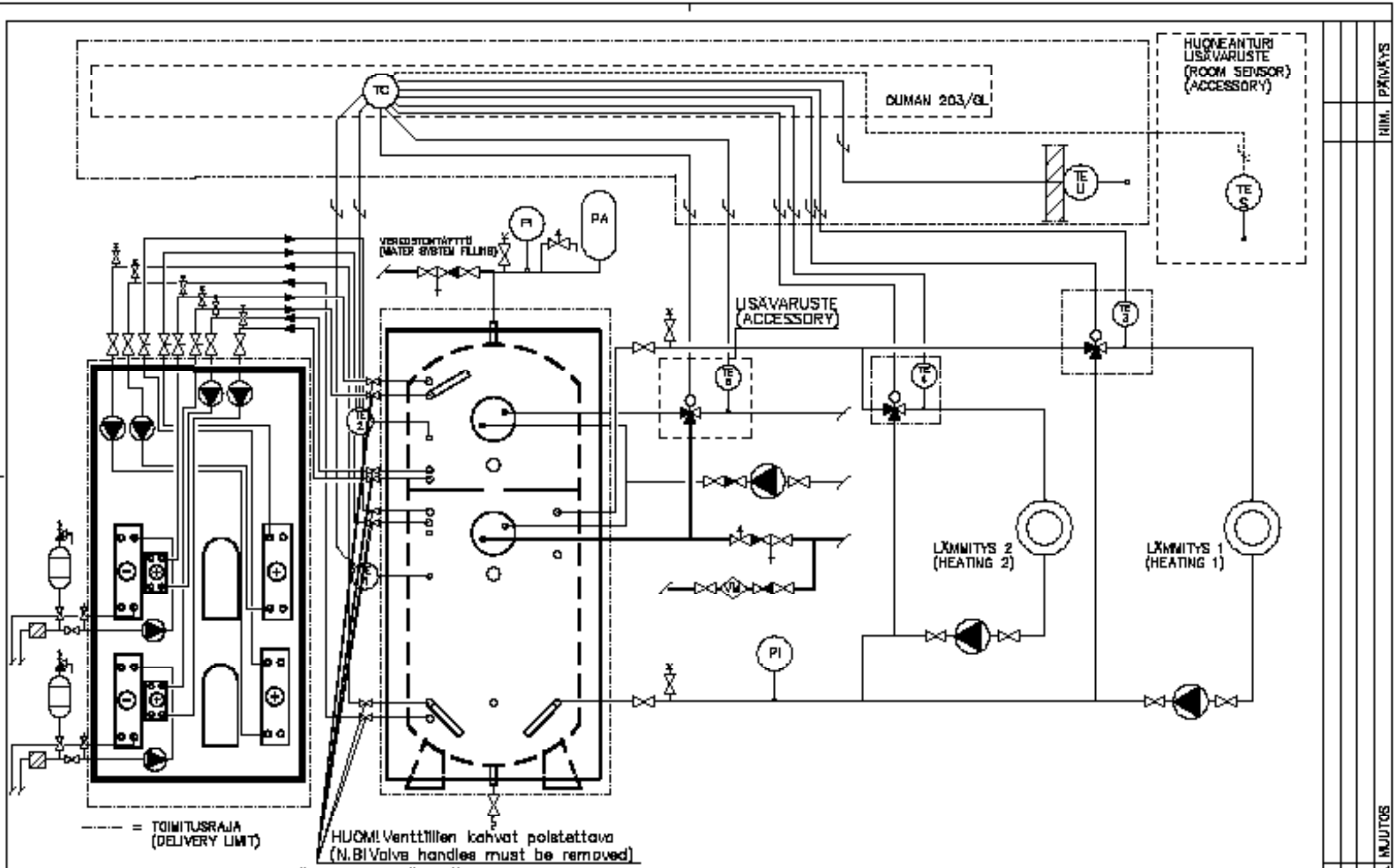


HYV. PÄIVÄYS

TUHTL LUKUM. MUUTOS

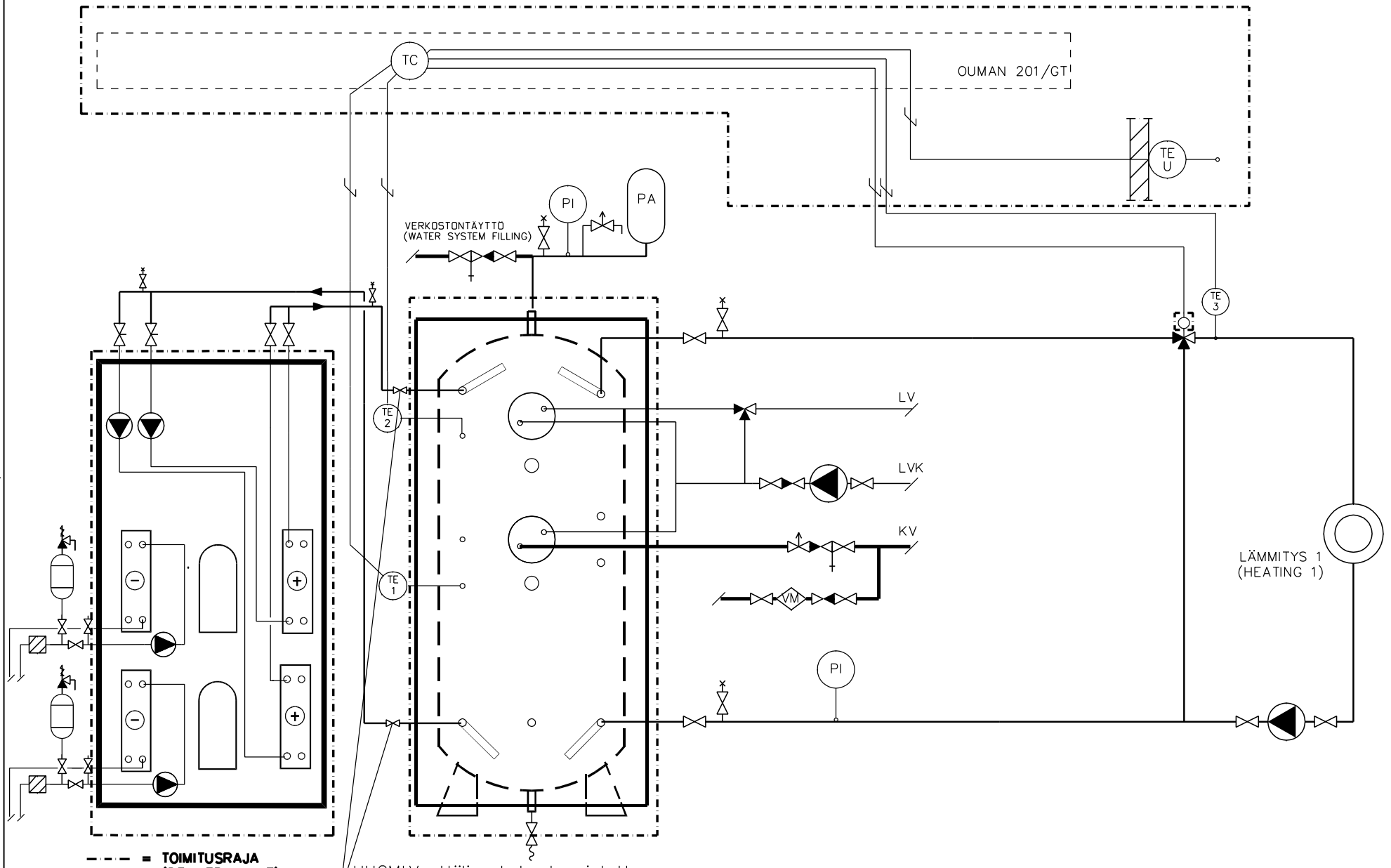
LÄMPÖÄSSÄ	JVI 17.12	HVAC SCHEMATIC/2-CIRCUIT CONNECTION CONTROL LÄMPÖÄSSÄ 201/GL LÄMPÖÄSSÄ T40-T80	LVI KYTKENTÄKAAVIO/2-PIIRIKYTKENTÄ OHJAUS LÄMPÖÄSSÄ 201/GL LÄMPÖÄSSÄ T40-T80

L_T40B0_201GL_09A



LÄMPÖÄSSÄ	JVI 17.12	HVAC SCHEMATIC/2-CIRCUIT CONNECTION CONTROL LÄMPÖÄSSÄ 203/GL LÄMPÖÄSSÄ T40-T80	LVI KYTKENTÄKAAVIO/2-PIIRIKYTKENTÄ OHJAUS LÄMPÖÄSSÄ 203/GL LÄMPÖÄSSÄ T40-T80	L_T4080_2D3GL_09A

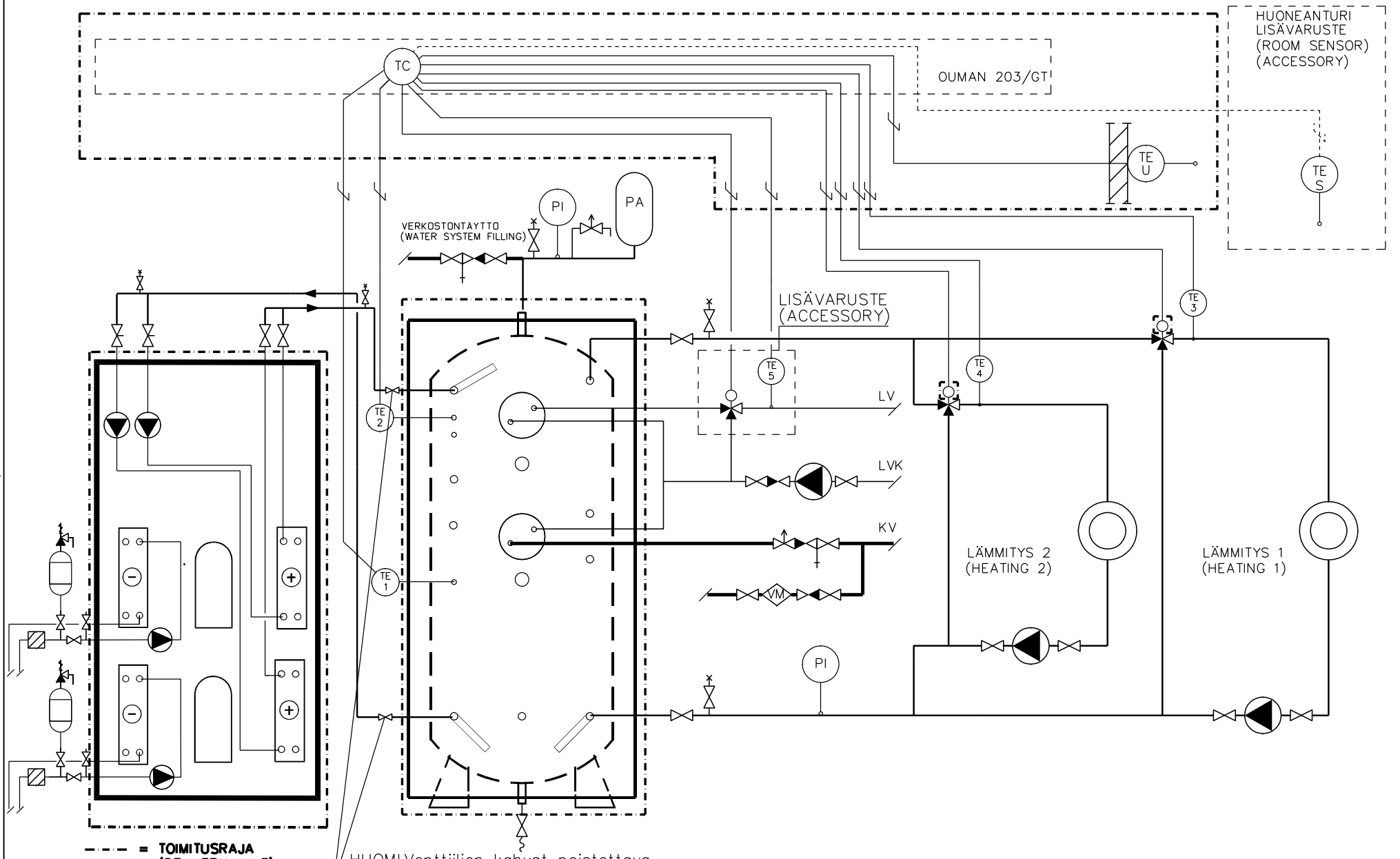
HIM. PÄIVÄYS
TURIN. LUKUN. MUUTOS



HUOM! PUMPUN JA VARAAJAN VÄLISET KYTKENNÄT EIVÄT KUULU TOIMITUKSEEN.
(N.B! CONNECTION BETWEEN WITH PUMP AND BOILER NOT ICNLUDE IN DELIVERY)

LÄMPÖÄSSÄ	SUUNN. JVi / PIIRT. / PVM. 24.11.2009 / ALLEKIRJOITUS	HVAC SCHEMATIC/1-CIRCUIT CONNECTION CONTROL LÄMPÖÄSSÄ 201/GT LÄMPÖÄSSÄ P40-P80	LVI KYTKENTÄKAAVIO/1-PIIRIKYTKENTÄ OHJAUS LÄMPÖÄSSÄ 201/GT LÄMPÖÄSSÄ P40-P80	SUUNNITTELUALA, TYÖN JA PIIRUSTUKSEN N:O L_P4080_201GT_10A / MUUTOS LEHTI / LEHDISTÄ / TILAAJAN N:O

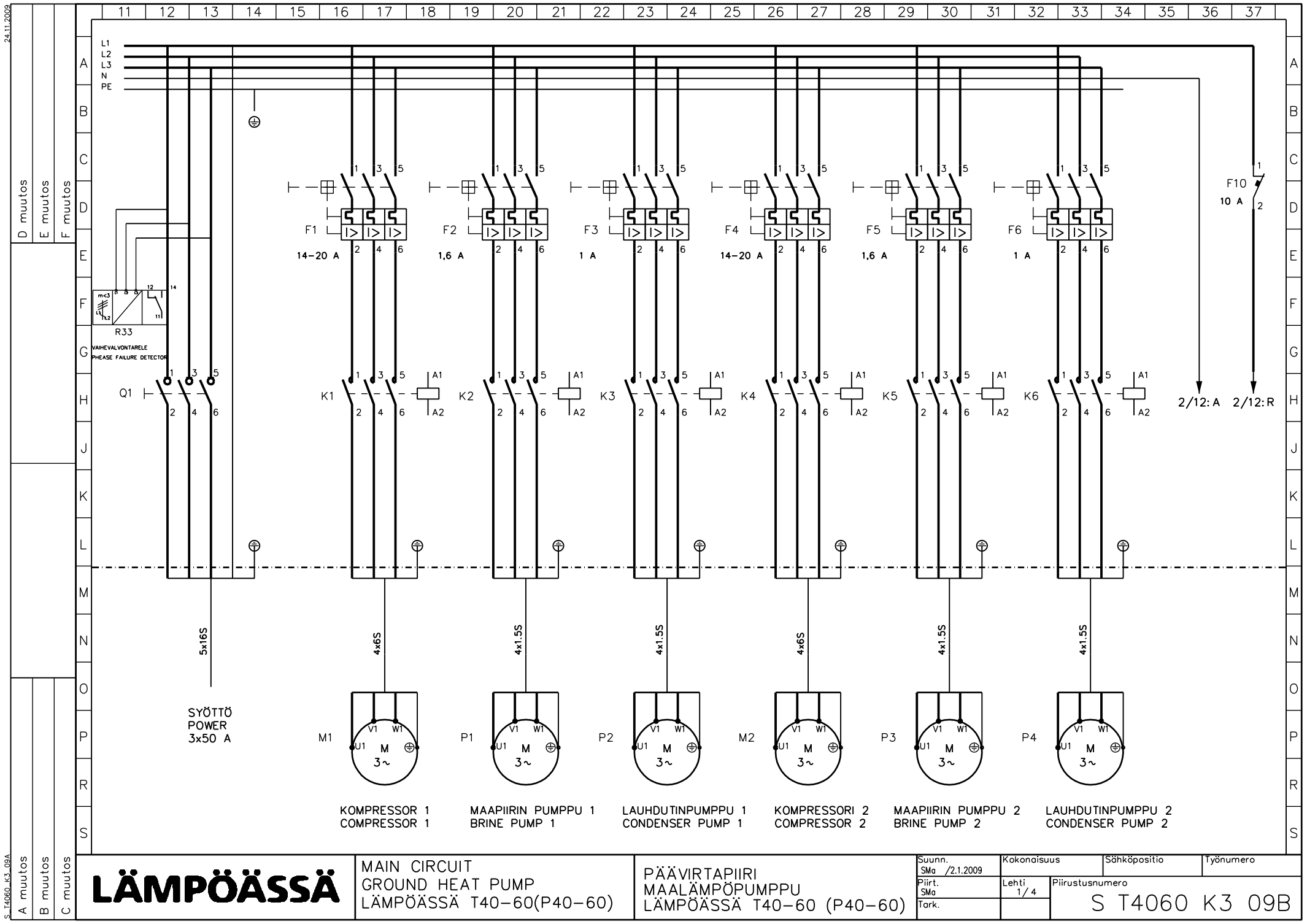
NIM. PÄIVÄYS
TUNN. LUKUM. MUUTOS



HUOM! PUMPUN JA VARAAJAN VÄLISET KYTKENNÄT EIVÄT KUULU TOIMITUKSEEN.
(N.B! CONNECTION BETWEEN WITH PUMP AND BOILER NOT ICNLUDE IN DELIVERY)

LÄMPÖÄSSÄ	SUUNN. JVi / PIIRT. / PVM. 24.11.2009 / ALLEKIRJOITUS	HVAC SCHEMATIC/2-CIRCUIT CONNECTION CONTROL LÄMPÖÄSSÄ 203/GT LÄMPÖÄSSÄ P40-P80	LVI KYTKENTÄKAAVIO/2-PIIRIKYTKENTÄ OHJAUS LÄMPÖÄSSÄ 203/GT LÄMPÖÄSSÄ P40-P80	SUUNNITTELUALA, TYÖN JA PIIRUSTUKSEN N:O / MUUTOS L_P4080_203GT_10A LEHTI / LEHDISTÄ / TILAAJAN N:O

TUNN. | LUKUM. | MUUTOS | NIM. | PÄIVÄYS



24.11.2009

D muutos | E muutos | F muutos

A muutos | B muutos | C muutos

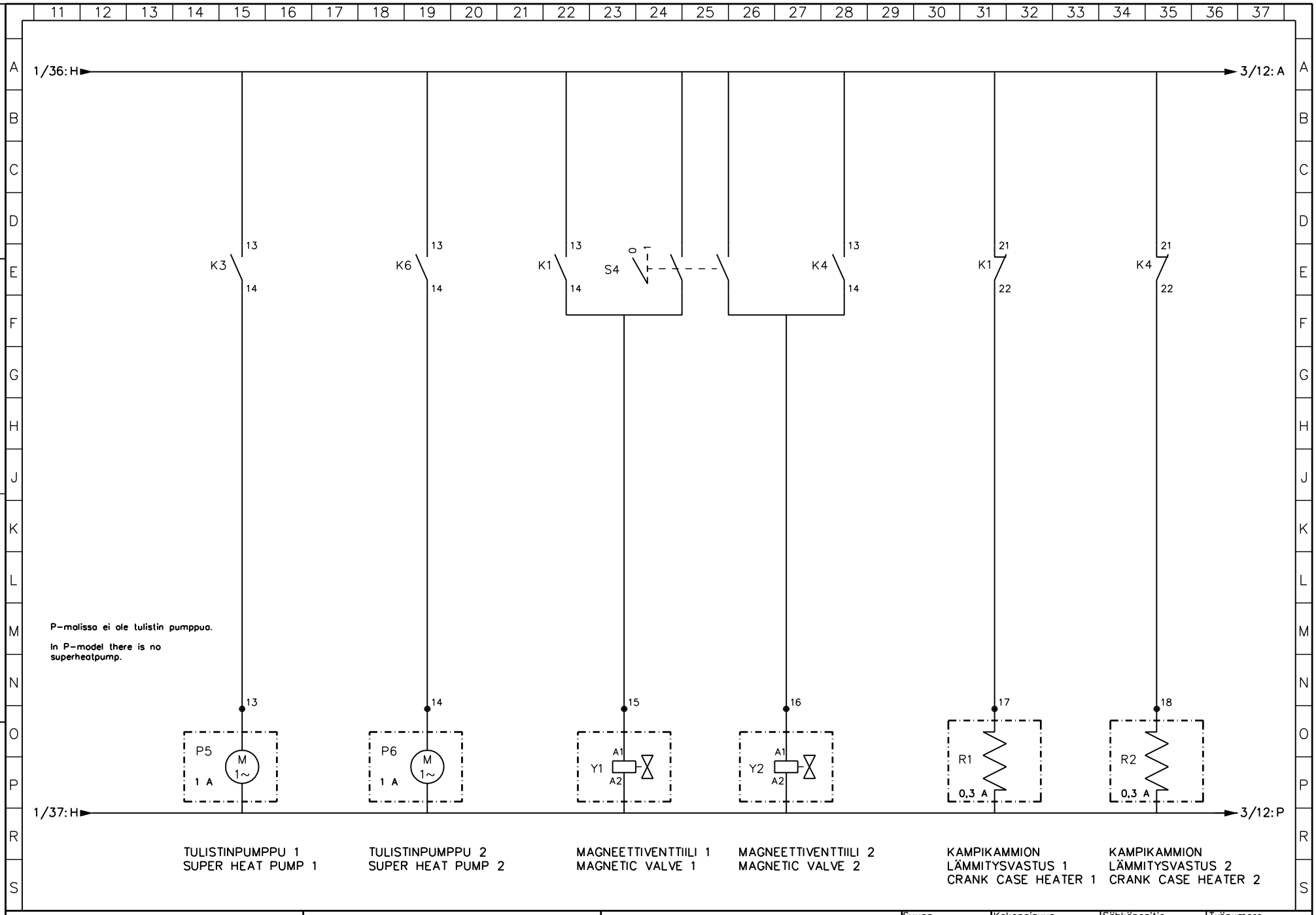
S_T4060_K3_09A

LÄMPÖÄSSÄ

MAIN CIRCUIT
GROUND HEAT PUMP
LÄMPÖÄSSÄ T40-60(P40-60)

PÄÄVIRTAPIIRI
MAALÄMPÖPUMPPU
LÄMPÖÄSSÄ T40-60 (P40-60)

Suunn. SMa /2.1.2009	Kokonaisuus	Sähköpositio	Työnumero
Piirt. SMa	Lehti 1/4	Piirustusnumero	S T4060 K3 09B
Tark.			



24.11.2009

D muutos | E muutos | F muutos

A muutos | B muutos | C muutos

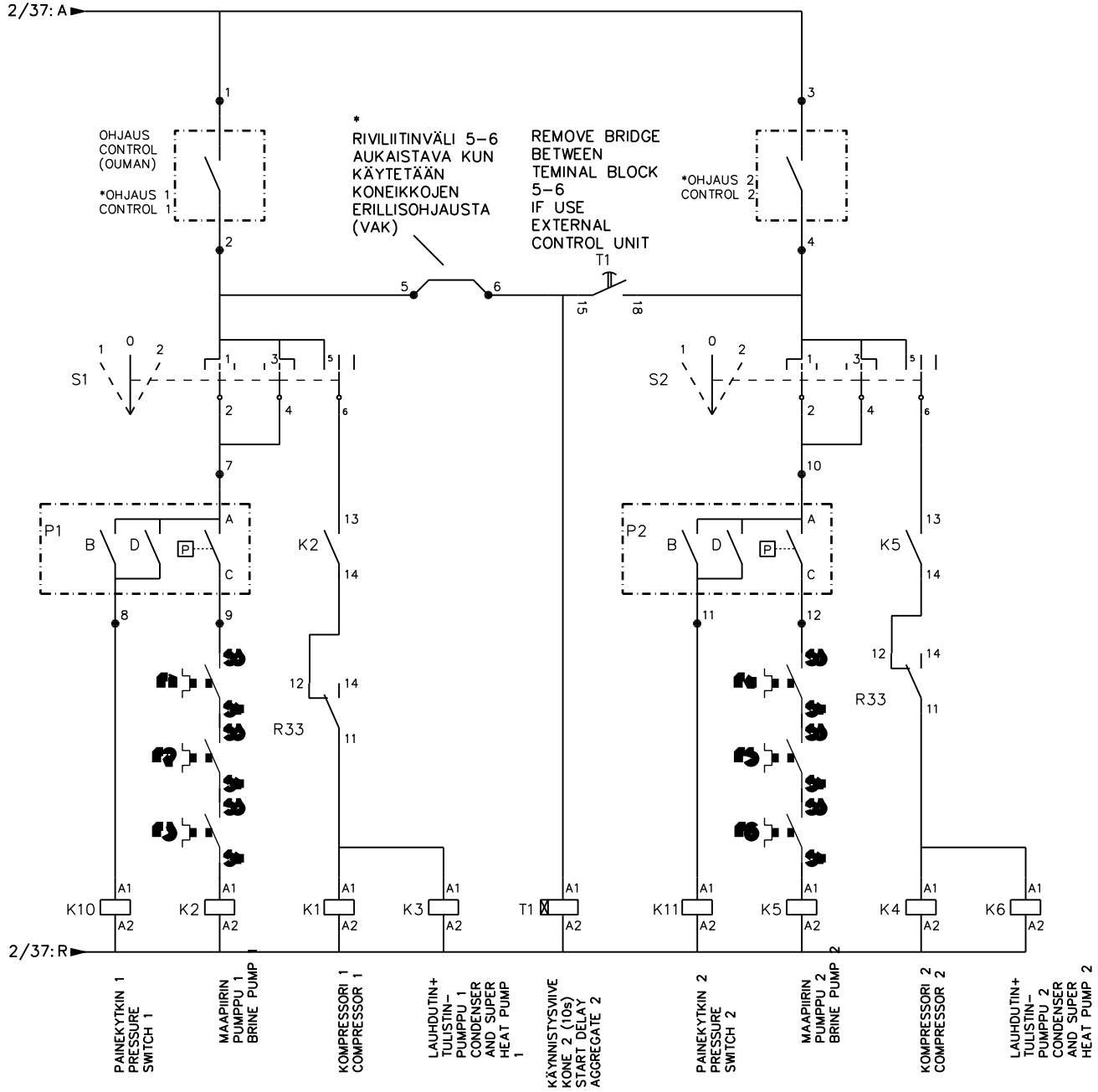
S_T4060_K3_09A

LÄMPÖÄSSÄ

CONTROL CIRCUIT
GROUND HEAT PUMP
LÄMPÖÄSSÄ T40–60(P40–60)

OHJ. VIRTAPIIRI PUMPUT+VENT.
MAALÄMPÖPUMPPU
LÄMPÖÄSSÄ T40–60 (P40–60)

Suunn.	Kokonaisuus	Sähköpositio	Työnumero
SMa /2.1.2009			
Piirt. SMa	Lehti 2 / 4	Piirustusnumero	S T4060 K3 09B
Tark.			



24.11.2009

D muutos
E muutos
F muutos

A muutos
B muutos
C muutos

S_T4060_K3_09A

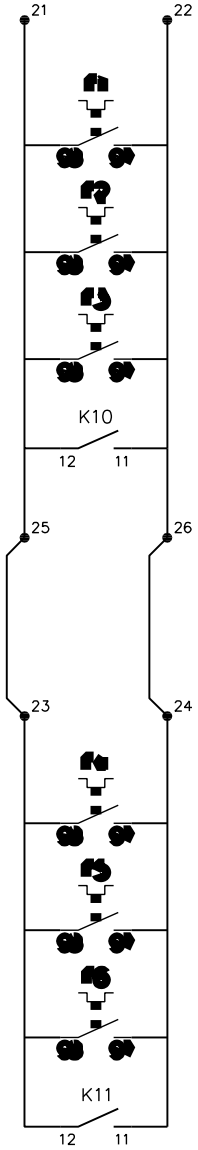
LÄMPÖÄSSÄ

CONTROL CIRCUIT
GRAUND HEAT PUMP
LÄMPÖÄSSÄ T40–60(P40–60)

OHJAUSVIRTAPIIRI
MAALÄMPÖPUMPPU
LÄMPÖÄSSÄ T40–60 (P40–60)

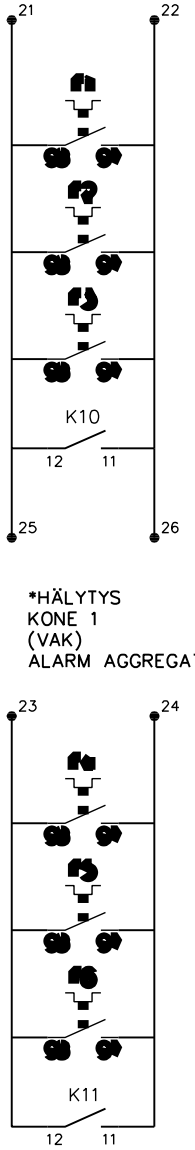
Suunn. SMa /2.1.2009	Kokonaisuus	Sähköpositio	Työnumero
Piirt. SMa	Lehti 3/4	Piirustusnumero S T4060 K3 09B	
Tark.			

HÄLYTYSKYTKENTÄ A (VAKIO)
ALARM CONNECTION A
(STAND.)



YHTEISHÄLYTYS
KONE 1+2
(OUMAN)
COMMON ALARM
AGGREGATE 1+2
(OUMAN)

HÄLYTYSKYTKENTÄ B
ALARM CONNECTION B



*HÄLYTYS
KONE 1
(VAK)
ALARM AGGREGATE 1 (STAND.)

*HÄLYTYS
KONE 2
(VAK)
ALARM AGGREGATE 2
(STAND.)

HÄLYTYSKYTKENTÄÄ A KÄYTETÄÄN SILLOIN, KUN HALUTAAN MAALÄMPÖPUMPULTA 1 YHTEISHÄLYTYS, ESIM. KÄYTETTÄESSÄ OUMAN-KESKUSTA. KYTKENTÄ A ON KESKUKSESSA VAKIONA.

HÄLYTYSKYTKENTÄÄ B KÄYTETÄÄN SILLOIN, KUN HALUTAAN MAALÄMPÖPUMPUN KONEIKOILTA 1 JA 2 ERILLISET HÄLYTYKSET, ESIM. KYTKETTÄESSÄ MAALÄMPÖPUMPPU KIINTEISTÖVALVONTAAN. RIVILIITINVÄLIT 23-25 JA 24-26 ON AUKAISTAVA KÄYTETTÄESSÄ HÄLYTYSKYTKENTÄÄ B.

USE CONNECTION A IF WANT COMMON ALARM BRINE PUMP 1 FOR EXAMPLE IF USE OUMAN CONTROL.CONNECTION A IS STANDARD.

USE CONNECTION B IF WANT SEPARATE ALARM FROM EACH AGGREGATE.FOR EXAMPLE IF GROUND HEAT PUMP CONNECT ESTATE CONTROL UNIT. IF USE CONNECTION B REMOVE BRIDGE BETWEEN BLOCK TERMINAL 23-25 AND 24-26

24.11.2009

D muutos
E muutos
F muutos

A muutos
B muutos
C muutos

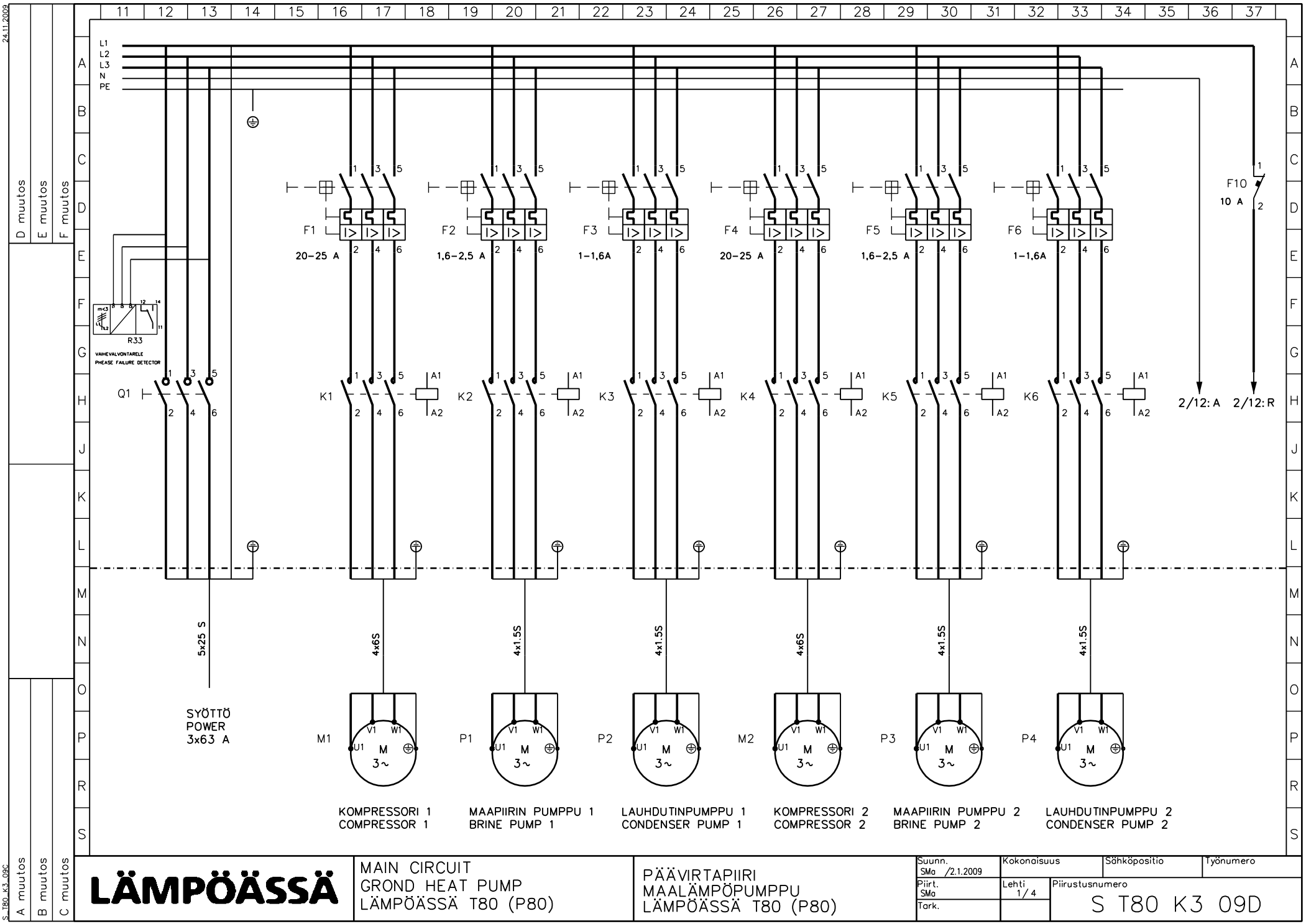
S_T4060_K3_09A

LÄMPÖÄSSÄ

ALARM CIRCUIT
GROUND HEAT PUMP
LÄMPÖÄSSÄ T40-60(P40-60)

HÄLYTYSPIIRI
MAALÄMPÖPUMPPU
LÄMPÖÄSSÄ T40-60 (P40-60)

Suunn. SMa /2.1.2009	Kokonaisuus	Sähköpositio	Työnumero
Piirt. SMA	Lehti 4 / 4	Piirustusnumero	
Tark.		S T4060 K3 09B	



24.11.2009

D muutos
E muutos
F muutos

A muutos
B muutos
C muutos

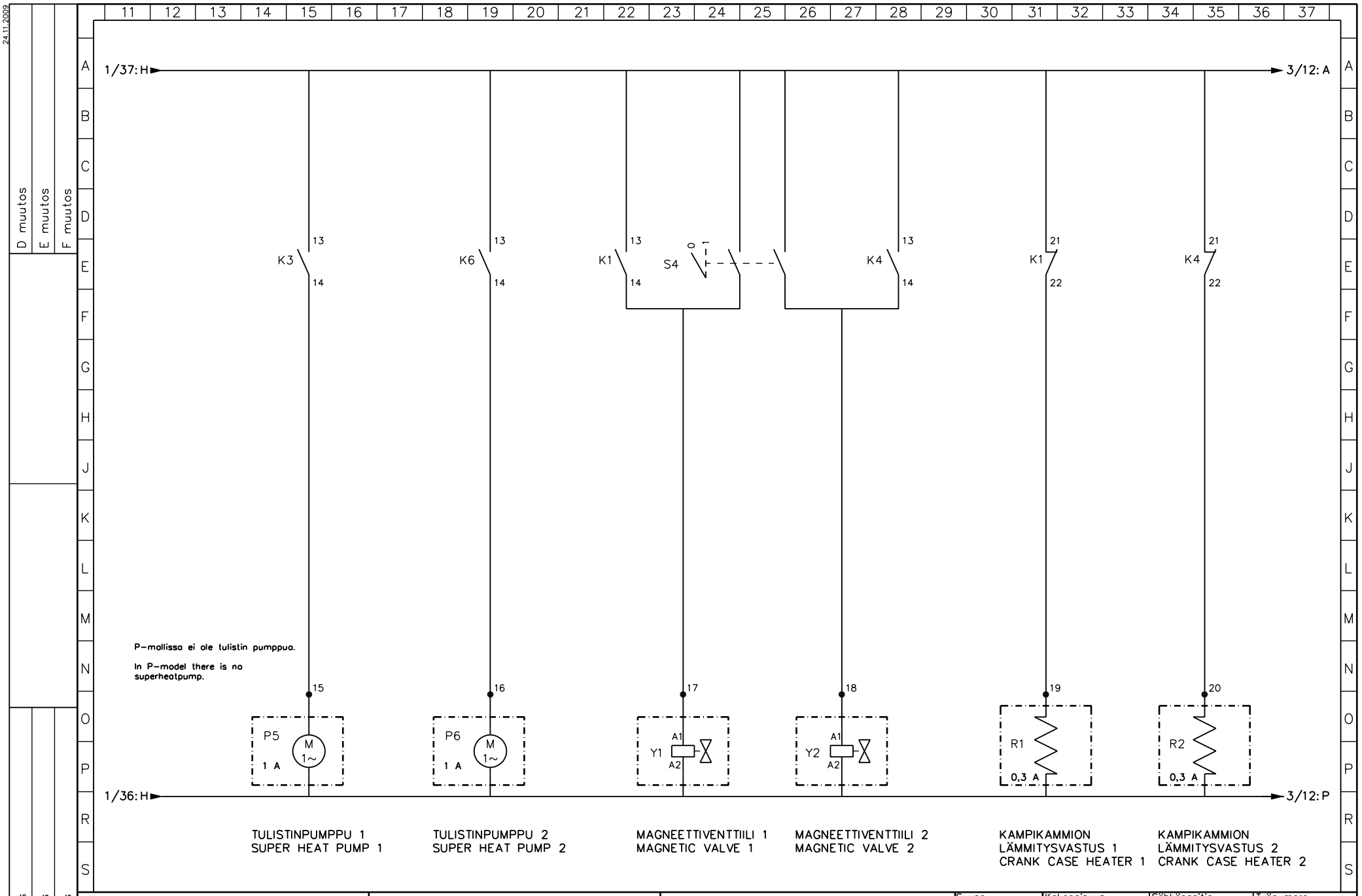
S_T80_K3_09C

LÄMPÖÄSSÄ

MAIN CIRCUIT
GROND HEAT PUMP
LÄMPÖÄSSÄ T80 (P80)

PÄÄVIRTAPIIRI
MAALÄMPÖPUMPPU
LÄMPÖÄSSÄ T80 (P80)

Suunn.	Kokonaisuus	Sähköpositio	Työnumero
SMa /2.1.2009			
Piirt. SMa	Lehti 1/4	Piirustusnumero	
Tark.		S T80 K3 09D	



24.11.2009

D muutos
E muutos
F muutos

A muutos
B muutos
C muutos

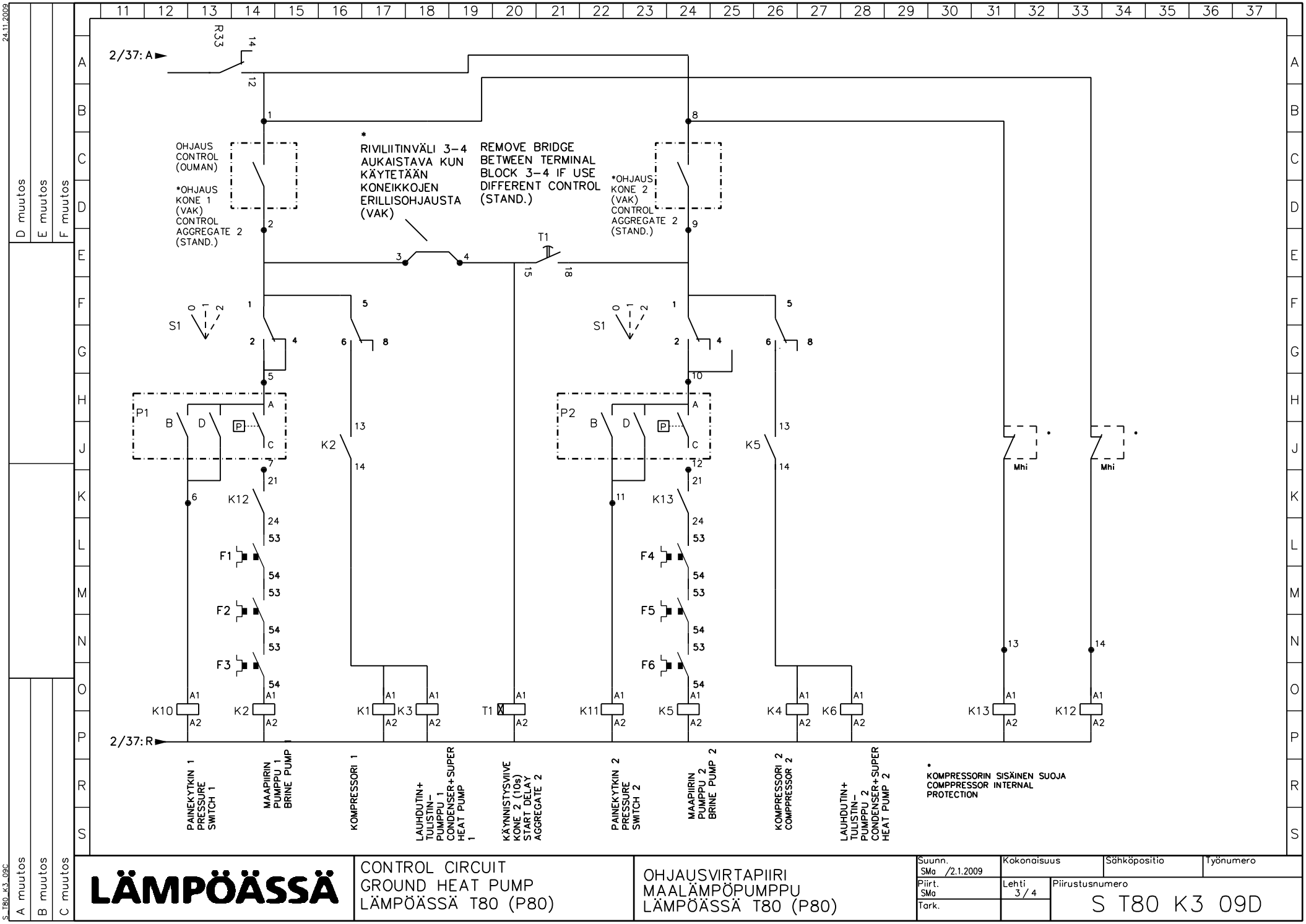
S_T80_K3_09C

LÄMPÖÄSSÄ

CONTROL CIRCUIT
GROUND HEAT PUMP
LÄMPÖÄSSÄ T80 (P80)

OHJ.VIRTAPIIRI PUMPUT+VENT.
MAALÄMPÖPUMPPU
LÄMPÖÄSSÄ T80 (P80)

Suunn. SMa /2.1.2009	Kokonaisuus	Sähköpositio	Työnumero
Piirt. SMa	Lehti 2/4	Piirustusnumero S T80 K3 09D	
Tark.			



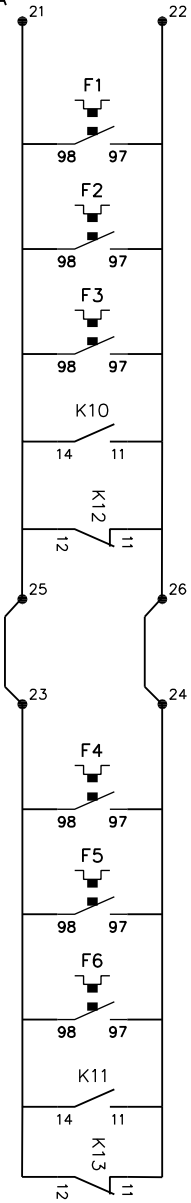
LÄMPÖÄSSÄ	CONTROL CIRCUIT GROUND HEAT PUMP LÄMPÖÄSSÄ T80 (P80)	OHJAUSVIRTAPIIRI MAALÄMPÖPUMPPU LÄMPÖÄSSÄ T80 (P80)	Suunn. SMa /2.1.2009	Kokonaisuus	Sähköpositio / Työnumero
			Piirt. SMa	Lehti 3/4	Piirustusnumero S T80 K3 09D
			Tark.		

D muutos
E muutos
F muutos
A muutos
B muutos
C muutos
24.11.2009
S_T80_K3_09C

24.11.2009

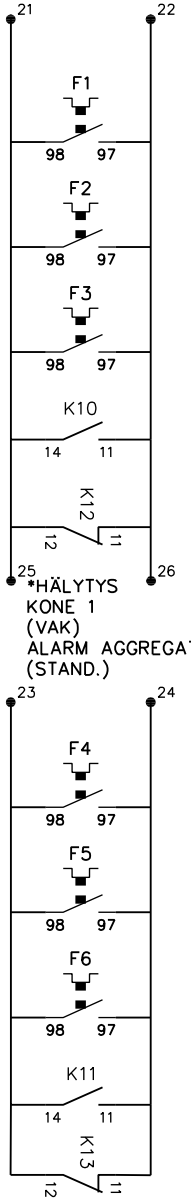
D muutos | E muutos | F muutos

HÄLYTYSKYTKENTÄ A
(VAKIO)
ALARM CONNECTION A
(STAND.)



YHTEISHÄLYTYS
KONE 1+2
(OUMAN)
COMMON ALARM AGGREGATE 1+2

HÄLYTYSKYTKENTÄ B
ALARM CONNECTION B



*HÄLYTYS
KONE 1
(VAK)
ALARM AGGREGATE 1
(STAND.)

*HÄLYTYS
KONE 2
(VAK)
ALARM AGGREGATE 2
(STAND.)

HÄLYTYSKYTKENTÄÄ A KÄYTETÄÄN SILLOIN, KUN HALUTAAN MAALÄMPÖPUMPULTA 1 YHTEISHÄLYTYS, ESIM. KÄYTETTÄESSÄ OUMAN–KESKUSTA. KYTKENTÄ A ON KESKUKSESSA VAKIONA.

HÄLYTYSKYTKENTÄÄ B KÄYTETÄÄN SILLOIN, KUN HALUTAAN MAALÄMPÖPUMPUN KONEIKOILTA 1 JA 2 ERILLISET HÄLYTYKSET, ESIM. KYTKETTÄESSÄ MAALÄMPÖPUMPPU KIINTEISTÖVALVONTAAN. RIVILIITINVÄLIT 23–25 JA 24–26 ON AUKAISTAVA KÄYTETTÄESSÄ HÄLYTYSKYTKENTÄÄ B. RELEET K12–K13 TOIMIVAT APURELEINÄ KOMPRESSORIN SISÄISELLE SUOJALLE.

USE CONNECTION A IF WANT COMMON ALARM FROM PUMP 1 FOR EXAMPLE IF USE OUMAN CUNTROL UNIT CONNECTIA A IS STANDARD.

USE CONNECTION B IF WANT SEPARATE ALARM FRON EACH AGGREGATE. FOR EXAMPLE IF GROUND HEAT PUMP CONNECT TO ESTATE CONTROL UNIT. REMOVE BRIDGE BETWEEN TERMINAL BLOCK 23–25 AND 24–26 IF USE CONNECTION B. RELAYS K12 AND K13 ARE AUXILIARY REALYS TO COMPRESSOR INTERNAL PROTECTION.

A muutos | B muutos | C muutos

S_T80_K3_09C

LÄMPÖÄSSÄ

ALARM CIRCUIT
GROUND HEAT PUMP
LÄMPÖÄSSÄ T80 (P80)

HÄLYTYSPIIRI
MAALÄMPÖPUMPPU
LÄMPÖÄSSÄ T80 (P80)

Suunn. SMa /2.1.2009	Kokonaisuus	Sähköpositio	Työnumero
Piirt. SMa	Lehti 4 / 4	Piirustusnumero	
Tark.		S T80 K3 09D	

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